Appendix A. Requirements - Test Case Mapping Matrix

wing matrix lists system level test cases mapped to one or more ECS Level 3 Requirements. In some instances ne relationship between a requirement and the tests needed to satisfy that requirement's objective.

3 Requirement Source ID - Level 3 Requirement.

Requirement Text - Text of Level 3 Requirement.

d/Build ID # - The thread or build within this release the test case or test cases will be found. A notation of B3 ide as Build 3 (Algorithm I&T Build). A notation of T2-1 identifies the entry as Thread 1 (TRMM TSDIS Interfa 2 (Ingest Build.).

d/Build Test Sequence/Case # - The test case or cases paragraph number within this document that map to the Thr and to the Level 3 Requirement ID the test will demonstrate or exercise. A "*" is used to indicate wild carding of a es of sequences under a section. A letter contained within parenthesis () indicates the test is applicable only to th requirement sub text referenced. A dash "-" indicates a particular test case under the sequence noted, rather than nce of tests being applicable. If there are multiple sub texts in the Requirement text and no subsetting under thi ll tests apply to all of the requirement text.

rement Category - The degree of priority assigned to a given requirement objective. The three (3) levels are al, Mission Essential and Mission Fulfillment.

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	Each DADS shall receive from the EDOS and SDPF, at a minimum, the following: a. Production data (L0)	B2	4.1.2.2.1, 4.1.2.2.3	mission essentia
	DADS shall be capable of receiving from the ADCs, at a minimum, the following for the purpose of product generation: b. Metadata c. Ancillary data	B2	4.1.2.2.1, 4.1.2.2.3-1	mission essentia
	Each DADS shall be capable of receiving from designated EPDSs at a minimum, the following: a. L0-L4 data sets b. Metadata	B2	4.1.2.2.1, 4.1.2.2.3-1	mission essentia
	Each DADS shall receive from the SCF, at a minimum, the following: g. Algorithms	B3	4.1.3.2.1	mission essentia
	Each DADS shall receive, at a minimum, data in the following forms: a. Physical electronic media b. Electronic communications network	B2	4.1.2.2.12(a) 4.1.2.2.* (b)	mission essentia
	Each DADS shall receive non-EOS correlative ancillary digital data.	B2	4.1.2.2.3, 4.1.2.2.1	mission essentia
	Each DADS shall check all metadata and data it receives. For each type of data described by the metadata, the data shall be checked for the presence of required fields, and correctness of the data set granule size.	B2	4.1.2.2.1-1, 4.1.2.2.1-1,2	mission essentia
	Each DADS shall generate status indicating the success or failure of metadata and data consistency checks.	B2	4.1.2.2.1-1	mission essentia
	The DADS shall provide storage for the following TRMM data: a. L0-L4 equivalent data products c. Associated ancillary data sets e. Associated metadata g. Algorithms.	B2, B3	4.1.2.2.1-1, 4.1.3.2.10, 4.1.2.2.1-1(c) 4.1.2.2.1-1(e) 4.1.2.2.1-1(g) 4.1.3.2.1(g)	mission essentia
	The DADS element shall collect the management data used to support the following system management functions: e. Performance Management f. Security Management	B2	4.1.2.2.1, 4.1.2.2.8-1	mission essentia

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	The DADS shall send data check and storage status to the provider of ingest data.	B2	4.1.2.2.1, 4.1.2.2.3	mission essentia
	Each DADS shall display, all faults to the system operators.	B2, B3	4.1.2.2.11, 4.1.3.2.10	mission essentia
	Each DADS shall monitor data transfer between external (non-ECS) elements and the DADS.	B2	4.1.2.2.11, 4.1.2.2.1	mission essentia
	Each DADS shall notify the originating source of the need to retransmit data in the event of transmission difficulties.	B2	4.1.2.2.1-2	mission essentia
	Each DADS shall maintain a file directory of all files under its control.	B2	4.1.2.2.8-2	mission essentia
	In case of corruption or catastrophic failure, capabilities for recovering the file directory shall be provided.	T4-1	4.2.6.2.5	mission essentia
	Operations/systems personnel shall be able to access, list, or modify the contents of the file directory in a special privileged mode.	T4-1	4.2.6.2.5	mission essentia
	Each DADS shall utilize the configuration management toolkit provided by the SMC.	T3-1, B3	4.1.3.2.2-1, 4.1.3.2.1-1, 4.1.3.2.2, 4.1.3.2.3, 4.1.3.2.4, 4.2.5.2.1, 4.2.5.2.2, 4.2.5.2.3, 4.2.5.2.4	mission essentia
	Each DADS shall, in conjunction with the SMC, provide configuration management for its internal resources.	T3-1, B3	4.1.3.2.2-1, 4.1.3.2.1-1, 4.1.3.2.2, 4.1.3.2.3, 4.1.3.2.4, 4.1.3.2.5, 4.2.5.2.1, 4.2.5.2.2, 4.2.5.2.3, 4.2.5.2.4	mission essentia
	ECS shall perform the following major functions: d. Communications and Networking e. Data Input f. Data Processing	B1, B2, T2-1, T2-2, B3, B4	4.1.1.1.2,(d) 4.1.1.2.4,(d) 4.1.1.2.6,(d) 4.1.1.2.7,(d)	mission essentia

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	g. Data Storage		4.1.2.2.1,(e) 4.1.2.2.3,(e) 4.2.4.2.1,(e) 4.2.3.2.1-1,2,3(e), 4.1.3.2.6,(f) 4.1.4.2.1(f) 4.1.2.2.*(g)	
	ECS shall provide the following integrated set of toolkits consisting of software tools for each ECS element:	T3-1, B3,	4.1.3.2.4, 4.1.3.2.5, 4.1.3.2.6, 4.2.5.2.7, 4.2.5.2.8, 4.2.5.2.9	mission essentia
	ECS shall be capable of being tested during all phases of its development.	B1, T3-1, B2, B3, B4, T1-1, T1-2, T2-1, T2-2, T4-1	All tests performed for this release	mission essentia
	Each ECS element shall be capable of verifying the fidelity of the ECS element interface to: b. Entities external to ECS at any time during the lifetime of the ECS	B2, B3, B4	4.1.2.2.3, 4.1.3.2.1, 4.1.3.2.9, 4.1.3.2.11, 4.1.4.2.1	mission critical
	Each ECS element shall be capable of being monitored during testing.	B1, T3-1, B2, B3, B4, T1-1, T1-2, T2-1, T2-2, T4-1	All tests performed for this release	mission fulfillmen
	ECS shall receive data from near term Earth Probe missions to include the following as a minimum: a. TRMM data for archive	B2	4.1.2.2.3	mission essentia
	ECS elements shall receive from EPDSs the following at a minimum: a. Data products e. Metadata	B2, T2-1, T2-2, B2, B4	4.1.2.2.3,(a) 4.2.3.2.1-2,3,(a) 4.2.4.2.1(a) 4.1.2.2.3,(e) 4.1.4.2.1(e)	mission essentia
	ECS shall provide maintenance and operations interfaces to the DAACs to support the function of: a) System Management b) Science Algorithm Integration f) System Maintenance	T4-1	4.2.6.2.5	mission essentia

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	ECS elements shall exchange with ADCs/ODCs, such as NOAA and other data processing and archiving facilities, information including the following: d. Science Data	B2, B4	4.1.2.2.3, 4.1.4.2.1	mission fulfillmen
	ECS elements shall receive data including the following type of supporting information from the ECS science community (TLs, TMs, PIs, and Co-Is): a. Algorithms b. Software fixes d. Integration support requests	B3, T3-1	4.1.3.2.1(a) 4.2.5.2.4,(b) 4.1.3.2.1(b) 4.1.3.2.13(d)	mission essentia
	The ECS elements shall send the following type of data at a minimum to the ECS science community (TLs, TMs, PIs, and Co-Is): a. Software Problem Reports	B3	4.1.3.2.13	mission fulfillmen
	A minimum of one backup which is maintained in a separate physical location (i.e., different building) shall be maintained for ECS software.	T4-1	4.2.6.2.5	mission critical
	Each computer providing product generation shall have an operational availability of 0.95 at a minimum (.9995 design goal).	B3	4.1.3.2.14	mission essentia
	ECS software shall enable transparent portability across heterogeneous site architectures, i.e., performing the same function at different ECS sites that may have different hardware implementations.	B1, B2, B3, B4, T1-1, T1-2, T2-1, T2-2, T3-1, T4-1	All tests performed for this release	mission fulfillmen
	The ESN shall enable researchers on existing networks (TCP/IP and GOSIP) to gain access to data and ECS services in a transparent manner to the underlying differences between the networks.	B1,T1-2	4.1.1.2.1, 4.1.1.2.3, 4.1.1.2.6, 4.1.1.2.7, 4.2.2.2.1, 4.2.2.2.2, 4.2.2.2.5	mission essentia
	The ESN internal networks shall be dedicated networks linking ECS facilities for internal ECS operations (e.g., scheduling, product generation, QA validation).	B1, T1-2	4.1.1.2.8, 4.1.1.2.9, 4.2.2.2.3	mission critical
	ESN shall interface with NSI to reach external non-ECS network-attached facilities.	B1	4.1.1.2.10	mission essentia
	ESN shall provide the following standard services:	B1, T1-1, T1-2, B3,	4.1.1.2.6,(a)	mission essentia

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	a. Data Transfer and Management Services b. Electronic Messaging Service c. Remote Terminal Service d. Process to Process Communication Service e. Directory and User Access Control Service f. Network Management Service g. Network Security and Access Control Service h. Internetwork Interface Services	B4, T4-1	4.1.1.2.5,(a) 4.1.1.2.7,(a) 4.1.3.2.1,(a) 4.2.1.2.4,(a) 4.2.1.2.5,(a) 4.2.1.2.6,(a) 4.2.2.2.4,(a) 4.1.4.2.2,(a) 4.1.1.2.2,(b) 4.2.1.2.5,(b) 4.2.1.2.2,(b) 4.2.1.2.3,(b) 4.1.1.2.1,(c) 4.2.2.2.1,(c) 4.2.2.2.5-1-4,(c) 4.1.1.2.4,(d) 4.1.1.2.3-1,4,(e) 4.2.6.2.4,(f) 4.1.1.2.8,(g) 4.1.1.2.9,(g) 4.1.4.2.2(h)	
	The ESN shall support the elements data flow requirements identified in this specification.			mission critical
	The ESN management function shall have a capability to obtain status on specific data flows, such as quick-look data products, to assure the successful operation of ESN.	B4	4.1.4.2.2	mission critical
	The ESN shall provide a help service to assist users with communication questions and problems.	B4	4.1.4.2.2	mission essentia
	The ESN shall provide file transfer and management service and as a minimum shall include the capability to transfer the following data types. a. Unstructured Text b. Binary Unstructured c. Binary Sequential d. Sequential Text	B1, T1-1, B3	4.1.1.2.6, 4.1.1.2.7, 4.2.1.2.4, 4.2.1.2.5, 4.2.1.2.6, 4.2.1.2.3, 4.1.3.2.1	mission critical
	The file transfer and management service shall be available in interactive and non-interactive services.	B1, T1-1, B3	4.1.1.2.6, 4.1.1.2.7, 4.2.1.2.4,	mission critical

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
			4.2.1.2.5, 4.2.1.2.6, 4.2.1.2.3, 4.1.3.2.1,	
	The file transfer and management non-interactive services shall be able to be scheduled.	B1, T1-1, B3	4.1.1.2.6, 4.1.1.2.7, 4.2.1.2.3, 4.2.1.2.4, 4.2.1.2.5, 4.2.1.2.6, 4.1.3.2.1,	mission critical
	The ESN shall interoperate and exchange messages and data with external SMTP mail systems.	B1, T1-2	4.1.1.2.5, 4.2.1.2.5-1-4	mission essentia
	The ESN shall provide interactive virtual terminal services.	B1	4.1.1.2.1	mission essentia
	The ESN shall provide process-to-process communication service.	B1	4.1.1.2.4	mission critical
	The ESN shall provide a name-to-attribute mapping Directory Service at a minimum.	B1	4.1.1.2.3-3,4	mission critical
	The directory function shall be able to respond to requests for information concerning named objects, either physical or logical, so as to support communications with those objects.			mission critical
	The ESN Directory Service shall be protected by access control capabilities.	B1	4.1.1.2.3	mission critical
	The ESN Directory service shall include services and supporting mechanisms to authenticate the credentials of a user for the purpose of granting access rights and authorizing requested operations.	B1	4.1.1.2.3	mission critical
	The ESN shall include multiple Directory Service Agents (DSAs) which shall be collectively responsible for holding or retrieving all directory information which is needed by ECS.	B1	4.1.1.2.3-3,4	mission critical
	The ESN shall include a network management function to monitor and control the ESN.	T4-1	4.2.6.2.4	mission critical
	The ESN shall include management functions at each ECS element, equipment or gateway within the ESN.			mission critical
	The ESN shall perform the following network management functions for each protocol stack implemented in any ECS element, and each communications facility:	B4	4.1.4.2.2	mission critical

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	a. Network Configuration Management b. Network Fault Management c. Network Performance Management d. Network Security Management			
	The ESN network management service shall retrieve performance/fault data about ESN protocol stacks and equipment.	B4	4.1.4.2.2	mission essentia
	The ESN report generation function shall provide, on an interactive and scheduled basis, accounting, network configuration, fault and performance management information.	B4	4.1.4.2.2	mission essentia
	The ESN query capability shall generate ad hoc statistics and reports based on parameters entered.	B4	4.1.4.2.2	mission essentia
	The ESN management service shall have the capability to redirect its reports to different devices such as console, disk or printer.	B4	4.1.4.2.2	mission essentia
	The ESN shall include the following configuration management functions at a minimum: a. collect information describing the state of the network subsystem and its communications resources, b. exercise control over the configuration, parameters, and resources of the subsystem, and over the information collected, c. store the configuration information collected, and d. display the configuration information.	B4	4.1.4.2.2	mission essentia
	The ESN shall be capable of displaying the local network configuration status related to each system locally, and for all systems at the ESN network management facility.	B4	4.1.4.2.2	mission essentia
	The ESN shall have the capability to detect and report communications related errors and events both locally and at the ESN network management facility.	B4	4.1.4.2.2	mission critical
	The ESN shall have error reporting and event logging.	B1, T1-1	4.1.1.2.4-1, 4.1.1.2.4-2, 4.1.1.2.4-3, 4.2.1.2.5-3,4,	mission critical
	Errors and events to be detected shall include at least: b. communications hardware errors c. protocol errors d. performance degradation conditions e. telecommunications errors and failures	B4	4.1.4.2.2	mission critical

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	The ESN fault management shall provide the capability to perform the following functions, at a minimum, both locally and at the ESN network management facility: c. enable and disable event reports within a system d. manage error and event logging files	B4	4.1.4.2.2	mission essentia
	The ESN performance management function shall provide the capability to evaluate the performance of ESN resources and interconnection activities.	B4	4.1.4.2.2, 4.1.4.2.3	mission essentia
	The ESN shall provide the capability to perform the following functions, at a minimum: a. generate/collect network statistics b. control collection/generation of network statistics c. store system statistics and statistical histories d. display the system statistics	B4	4.1.4.2.3	mission essentia
	The ESN shall provide protocol translation, termination, bridging and routing.	B1	4.1.1.2.5, 4.1.1.2.6	mission critical
	The ESN shall provide necessary translation within supported file transfer and e-mail services.	B1, T1-1	4.1.1.2.6, 4.1.1.2.5, 4.2.1.2.5, 4.2.1.2.6, 4.2.1.2.3	mission critical
	The ESN shall interoperate with NSI to provide user access to ECS.	T1-2	4.2.1.2.5-6	mission critical
	The ESN shall provide support for TCP/IP communications protocols and services to external interfaces as required by the IRDs.	T1-2	4.2.1.2.5-7	mission critical
	The ESN LANs shall provide physical devices and the corresponding medium access control (MAC) protocol compatible with ISO and ANSI standards.	B1		mission critical
	The ESN shall control access of processes and users through an authentication and authorization service that meets GNMP standards.	B1, T1-1	4.1.1.2.3, 4.1.1.2.1, 4.2.1.2.1-1-3	mission critical
	The following security functions and services, at a minimum, shall be provided: a. authentication b. access (authorization) control	B1, T1-1	4.1.1.2.1-1-6, 4.2.1.2.1-1-3, 4.1.1.2.1-1-6(b)	mission critical
	The ESN shall provide the following security event functions:	T1-1	4.2.1.2.1-1-5	mission critical

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	a. Event detection b. Event reporting c. Event logging		4.2.1.2.2-5 4.2.1.2.3-5 4.2.1.2.4-1-4 4.2.1.2.5-1-4 4.2.1.2.6-1	
	The PGS shall provide tools to help the PGS staff create and modify SDPS plans.	B3	4.1.3.2.6	mission essentia
	The PGS shall maintain an algorithm processing control language capable of constructs (e.g., if-then-else) based on the complexities of the PGS. This control language shall be utilized in conjunction with a database of product specifications that contains the recipe for the generation of all Standard Products allocated to that PGS including, at a minimum: a. The algorithm(s) to be used b. The order in which algorithms are to be executed c. The input data sets required d. Time and other processing resources required	B3	4.1.3.2.6	mission essentia
	The PGS shall provide the capability to perform the following functions, at a minimum: b. Suspend execution of tasks c. Resume execution of a suspended task d. Cancel execution of tasks	B3	4.1.3.2.6-3(b) 4.1.3.2.6-4(c) 4.1.3.2.6-5(d)	mission essentia
	The PGS element shall collect the management data used to support the following system management functions: e. Performance Management f. Security Management	B3	4.1.3.2.13-1	mission essentia
	The PGS shall display detected faults to the system operators.	B3	4.1.3.2.7-1-3 4.1.3.2.9-2 4.1.3.2.10-1-4	mission essentia
	The PGS shall generate a PGS processing log that accounts for all data processing activities.	B3	4.1.3.2.7-4, 4.1.3.2.6-11, 4.1.3.2.10-5	mission essentia
	The PGS shall utilize the LSM to generate a PGS resource utilization report.	B3	4.1.3.2.6-12	mission essentia
	The PGS shall have the capability to monitor the status of all algorithm and calibration coefficient testing and generate algorithm and calibration test reports.	B3	4.1.3.2.*	mission essentia

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	The PGS shall provide tools to analyze system performance.	B3	4.1.3.2.13-2	mission essentia
	The PGS shall utilize the LSM to monitor and account for data and information transfer between it and other EOSDIS elements.	T1-1, T1-2, B1	4.2.1.2.4, 4.2.1.2.5, 4.2.1.2.6, 4.2.2.2.4, 4.1.1.2.7, 4.1.1.2.2, 4.2.2.2.5,	mission essentia
	The PGS shall have the capability to access and use, for the generation of Standard Products, information such as: a. Digital terrain map databases b. Land/sea databases c. Climatology databases d. Digital political map databases			mission essenti
	The PGS shall have the capability to accept POSIX-compliant science algorithms and compile algorithm source code written in a standard programming language (e.g., FORTRAN, C, Ada).	T3-1, B3	4.1.3.2.3, 4.2.5.2.7-3,4	mission essenti
	The PGS shall accept from the SCFs new or modified calibration coefficients to be validated in the test environment. Calibration coefficients shall contain the following information at a minimum: a. Identification of coefficient data set b. Calibration coefficients values c. Author and version number d. Identification of related processing algorithm e. Start and stop date/time of applicability f. Date and time g. SCF identification h. Reasons for update	T3-1, B3	4.1.3.2.1-1 4.1.3.2.11-3 4.2.5.2.9-3	mission essenti
	The PGS shall have the capability to validate received calibration coefficients for completeness and correct format.	T3-1, B3	4.1.3.2.3, 4.2.5.2.7-3,4 4.1.3.2.4, 4.1.3.2.5	mission essenti
	The PGS shall accept from the SCF new or modified Standard Product algorithms to be tested at the processing facility. This software shall be received into the test environment and shall contain the following information at a minimum : a. Algorithm identification b. Algorithm source code	T3-1, B3	4.1.3.2.1, 4.2.5.2.5-1	mission essenti

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	c. List of required inputs d. Processing dependencies e. Test data and procedures f. Algorithm documentation			
	The PGS shall have the capability to validate required operational algorithm characteristics prior to scheduling algorithm test time. These characteristics shall be include at a minimum: a. Language b. Operational impacts (e.g., algorithm software size, required resources) c. Algorithm documentation d. Data handling standards as appropriate e. Units and models used f. Operational compatibility g. Required metadata outputs	B3	4.1.3.2.3-3	mission essenti
	The PGS shall have the capability to schedule and coordinate algorithm and calibration coefficient test time in the test environment with the appropriate SCF.			mission essenti
	The PGS shall send test products to the SCF for analysis. These shall contain the results of algorithm testing and shall contain the following information at a minimum: a. Algorithm identification b. Test time(s) c. Processor identification d. Test results	B3	4.1.3.2.9	mission essenti
	The PGS shall have the capability to support analysis of algorithm test results.	B3	4.1.3.2.8.	mission essenti
	The PGS shall have the capability to validate, through testing, that SCF processing algorithms will execute properly in the operational environment. Validation shall include final compilation and linkage of the source code and testing to verify proper software execution in the operational environment based on indicated data and test results provided by the SCF and the investigator, but shall not include scientific validation of products.	T3-1, B3	4.1.3.2.8, 4.2.5.2.8	mission essenti
	The PGS shall validate algorithms used for conversions, calibrations and transformations of EOS engineering data.	T3-1	4.2.5.2.7	mission essenti
	The PGS shall provide storage for all candidate algorithms' software	T3-1, B3	4.1.3.2.1-1	mission essenti

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	executables and calibration coefficients.		4.1.3.2.11-3 4.2.5.2.5-1	
	The PGS shall interface to the SMC to maintain configuration control of all algorithms and calibration coefficients used in operational Standard Product production. Controlled information shall contain at a minimum: a. Source code including version number and author b. Benchmark test procedures, test data, and results c. Date and time of operational installation d. Compiler identification and version e. Final algorithm documentation	T3-1, B3	4.1.3.2.2-1 4.2.5.2.5-1	mission essenti
	The PGS shall provide file access subroutines that enforce compliance with the adopted standard ECS formats.	T3-1, B3	4.1.3.2.3-1,2 4.2.5.2.7-5,6	mission essentia
	The PGS shall provide job control routines that provide all required task parameters to the Standard Product software.	B3	4.1.3.2.6	mission essentia
	The PGS shall provide error logging subroutines for use by Standard Product software in notifying the system operators of conditions requiring their attention.	B3	4.1.3.2.1-2,3, 4.1.3.2.3-2, 4.1.3.2.4-2, 4.1.3.2.5-2, 4.1.3.2.8-2, 4.1.3.2.6-2, 4.1.3.2.9-2,3,	mission essentia
	The PGS shall provide error logging subroutines for use by Standard Product software in notifying users of conditions requiring their attention.	B3	4.1.3.2.1-2,3, 4.1.3.2.3-2, 4.1.3.2.4-2, 4.1.3.2.5-2, 4.1.3.2.8-2, 4.1.3.2.6-2, 4.1.3.2.9-2,3,	mission essentia
	The PGS shall provide mass storage allocation subroutines that provide algorithms with a means for dynamic allocation of storage for temporary files.	B3	4.1.3.2.6-1-5	mission essentia
	The PGS shall provide ancillary data access subroutines that provide Standard Product software access to ephemeris data (e.g., solar, lunar, and satellite ephemeris), Earth rotation data, and time and position measurement data. These subroutines shall perform operations such as:	T3-1	4.2.5.2.9, 4.2.5.2.8	mission essentia

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	a. Interpolation b. Extrapolation c. Coordinate system conversion			
	The PGS shall provide mathematical libraries including: a. Linear algebra and analysis (e.g., LINPAC, IMSL) b. Statistical calculations (e.g., SAS, SPSS)	T3-1	4.2.5.2.8	mission essentia
	The PGS shall provide a Science Processing Library containing routines such as: a. Image processing routines b. Data visualization routines c. Graphics routines	T3-1	4.2.5.2.10	mission essentia
	The PGS shall provide a toolkit to the SCF containing versions of the routines specified in requirements PGS-0970 to PGS-1020.	T3-1	4.2.5.2.8	mission essentia
	The PGS shall have the capability to receive GFE databases and associated tools, including COTS and public domain databases, and maintain them as required as inputs to product generation. Example databases are: a. Digital terrain map databases b. Land/sea databases c. Climatology databases d. Digital political map databases	T3-1	4.2.5.2.6	mission essentia
	Each PGS shall have the capacity to support I/O to temporary and intermediate storage or multiple passes over input products as required by individual science algorithms.	B3	4.1.3.2.14	mission essentia
	The SDPS shall provide CSMS with operational, and data processing status.	B2, B4	4.1.2.2.*, 4.1.4.2.*	mission essentia
	The SDPS shall receive directives on priorities and policy, including schedule conflict resolutions, from the SMC.			mission essentia
	The SDPS shall coordinate and resolve schedule conflicts between IMS, DADS and PGS.			mission essentia
	The SDPS shall receive EOS science, and engineering data from the SDPF, and non-EOS ancillary data (as listed in Appendix C) from ADCs.	B2, B4	4.1.2.2.3, 4.1.4.1.1, 4.1.2.2.1	mission essentia
	The SDPS shall archive, quality check all science data received from the EPDSs and ancillary data received from the ADCs.	B2, B4	4.1.2.2.3, 4.1.2.2.4, 4.1.4.2.1	mission essentia

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	The SDPS shall interface with the PIs to support the development of data product algorithms.	B3, B1	4.1.3.2.1, 4.1.1.2.4, 4.1.3.2.9	mission essentia
	The SDPS shall be responsible for coordination of the transfer of production and quick-look science and engineering data from SDPF.	B2	4.1.2.2.3, 4.1.2.2.4	mission essentia
	The SDPS shall support element test activities throughout the development phase.	B1, B2, B3, B4, T1-1, T1-2, T2-1, T2-2, T3-1, T4-1	All Tests performed for this release.	mission essentia
	The SMC shall make available for automated distribution to authorized users all unlicensed toolkit software, toolkit software upgrades, and toolkit documentation.	T4-1	4.2.6.2.4	mission essentia
	The SMC shall administer and distribute licenses for deployed commercial-software funded by the ECS contract, including commercial software as authorized for specific users.	T4-1	4.2.6.2.4	mission essentia
	The SMC shall assist each site or element, when necessary, in the performance of on-site preventive and corrective hardware and systems software maintenance.	T4-1	4.2.6.2.4, 4.2.6.2.2	mission essentia
	The LSM shall support on-site preventive and corrective hardware and systems software maintenance.	T4-1	4.2.6.2.4, 4.2.6.2.2	mission critical
	The SMC shall coordinate with each site or element in the management of off-site corrective hardware and systems software maintenance.	T4-1	4.2.6.2.4, 4.2.6.2.2	mission essentia
	The LSM shall coordinate with the SMC in the management of off-site corrective hardware and systems software maintenance.	T4-1	4.2.6.2.4, 4.2.6.2.2	mission critical
	The SMC shall monitor hardware and systems software maintenance status for off-site repair actions.	T4-1	4.2.6.2.4, 4.2.6.2.2	mission essentia
	The SMC shall monitor the spares inventory within each element.	T4-1	4.2.6.2.2, 4.2.6.2.5	mission critical
	The LSM shall monitor the spares inventory within its element.	T4-1	4.2.6.2.2, 4.2.6.2.5	mission critical
	The SMC shall oversee the replenishment of spare parts for all elements.	T4-1	4.2.6.2.2, 4.2.6.2.5	mission critical
	The LSM shall manage the replenishment of spare parts within its element.	T4-1	4.2.6.2.2, 4.2.6.2.5	mission critical

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	The SMC shall monitor the consumable inventory within each element for items used by the system including, at a minimum: a. Computer tapes b. Computer disks c. Computer paper	T4-1	4.2.6.2.2, 4.2.6.2.5	mission essentia
	The LSM shall monitor the consumable inventory within its element for items used by the system including, at a minimum: a. Computer tapes b. Computer disks c. Computer paper	T4-1	4.2.6.2.2, 4.2.6.2.5	mission essentia
	The SMC shall monitor the replenishment of consumable items for all elements.	T4-1	4.2.6.2.2, 4.2.6.2.5	mission essentia
	The LSM shall manage the replenishment of consumable items for its element.	T4-1	4.2.6.2.2, 4.2.6.2.5	mission essentia
	The SMC shall establish and maintain a system-wide inventory of all hardware contained within ECS, including at a minimum: a. Hardware identification numbers b. Version numbers and dates c. Manufacturer d. Part number e. Serial number f. Name and locator information for software maintenance g. Location where hardware is used	T4-1	4.2.6.2.4	mission essentia
	The LSM shall update the system-wide inventory data base consisting of all hardware, system software, and scientific software contained within its element.	T4-1	4.2.6.2.4	mission critical
	The SMC shall provide at a minimum system-wide configuration management for the operational hardware, scientific and system software, and the SMC toolkit contained within ECS. The management system shall support the migration of hardware and software upgrades into the operational environment.	T3-1	4.2.5.2.1, 4.2.5.2.2, 4.2.5.2.3, 4.2.5.2.4, 4.2.5.2.5	mission essentia
	The LSM shall provide configuration management for at least the operational hardware, system software, and scientific software within its element and for the migration of enhancements into the operational system.	T3-1	4.2.5.2.1, 4.2.5.2.2, 4.2.5.2.3, 4.2.5.2.4, 4.2.5.2.5	mission critical
	Upon approval to include a fully tested enhancement to the	T3-1	4.2.5.2.5	mission essentia

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	algorithms, the SMC shall provide overall management of the implementation of the approved and modified software into the operational environment.			
	The SMC shall monitor site and element hardware, and scientific and system software status to determine their operational states including, at a minimum: a. On-line b. Failed	B2, B3, B4	4.1.2.2.6, 4.1.3.2.7-1-3, 4.1.3.2.11-2, 4.1.4.2.2	mission essentia
	The LSM shall monitor its element's hardware, and scientific and system software status to determine their operational states including, at a minimum : a. On-line b. Failed	B2, B3, B4	4.1.2.2.6, 4.1.3.2.7-1-3, 4.1.3.1.2.11-2, 4.1.4.2.2	mission critical
	For each performance parameter, the SMC shall have the capability of establishing multiple levels of thresholds to include, at a minimum: a. On/off b. Pass/fail c. Various levels of degradation	T4-1	4.2.6.2.1	mission essentia
	For each limit checked parameter, the LSM (including those thresholds directed by the SMC) shall have the capability of evaluating multiple levels of thresholds including, at a minimum: a. On/off b. Pass/fail	T4-1	4.2.6.2.4	mission critical
	The SMC shall evaluate overall system performance.	T4-1	4.2.6.2.2	mission essentia
	The LSM shall evaluate system performance against the ESDIS project established performance criteria.	T4-1	4.2.6.2.2, 4.2.6.2.4	mission essentia
	The SMC shall generate alert indicators of fault or degraded conditions.	T4-1	4.2.6.2.1	mission critical
	The LSM shall generate, in response to each limit check threshold, alert indicators of fault or degraded conditions with the appropriate corrective actions.	T4-1	4.2.6.2.2, 4.2.6.2.4	mission essentia
	The SMC shall generate, as needed, requests for performance testing that includes, at a minimum: a. Resource to be tested b. Test purpose c. Requested test priority	T4-1	4.2.6.2.4	mission essentia

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	d. Required test environment e. Impacts to operations f. Expected test results			
	The SMC shall perform short and long-term trend analysis of system, site, and element performance to include, at a minimum: a. Operational status b. Performance of a particular resource c. Maintenance activities (e.g., number of repairs per item)	T4-1	4.2.6.2.4	mission essentia
	The LSM shall perform short and long-term trend analysis of element performance, including, at a minimum: a. Operational status b. Performance of a particular resource c. Maintenance activities (e.g., number of repairs per item)	T4-1	4.2.6.2.2	mission essentia
	The SMC shall support, maintain, and update system fault management policies and procedures including, at a minimum: a. Fault identification b. Fault priorities c. Recovery or corrective actions	T4-1	4.2.6.2.2	mission essentia
	The LSM shall maintain fault management policies and procedures for its element.	T4-1	4.2.6.2.2	mission essentia
	The SMC shall perform fault analysis including, at a minimum: a. Isolation b. Location c. Identification d. Characterization	B2, B3, B4	4.1.2.2.6, 4.1.3.2.7, 4.1.3.1.2.11, 4.1.4.2.2	mission essentia
	The SMC shall have the capability to perform fault analysis to the level of, at a minimum: a. Subsystem b. Equipment	B2, B3, B4	4.1.2.2.6, 4.1.3.2.7, 4.1.3.2.11, 4.1.4.2.2	mission essentia
	The LSM shall, at a minimum, isolate, locate, and identify faults, identify subsystem, equipment, and software faults, and identify the nature of the faults within its element.	B2, B3, B4	4.1.2.2.6, 4.1.3.2.7, 4.1.3.2.11, 4.1.4.2.2	mission critical
	MC shall support fault diagnosis testing to include, at a minimum: b. Resource-to-resource connectivity testing			mission essentia
	The LSM shall request fault diagnosis testing be performed, including, at a minimum:	T4-1	4.2.6.2.2, 4.2.6.2.4	mission essentia

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	b. Resource-to-resource connectivity testing within its element			
	The SMC shall, in conjunction with sites and elements, establish, support, maintain, and update security policies and procedures to include, at a minimum: a. Physical security b. Password management c. Operational security d. Data security e. Privileges f. Network security g. Compromise mitigation	T4-1	4.2.6.2.2	mission essentia
	The LSM shall maintain security policies and procedures, including, at a minimum: a. Physical security b. Password management c. Operational security d. Data classifications e. Access/privileges f. Compromise mitigation	T4-1	4.2.6.2.2	mission critical
	The SMC shall establish, maintain, and authenticate access privileges for ECS scientific users.	T4-1	4.2.6.2.1	mission critical
	The LSM shall promulgate, maintain, authenticate, and monitor user and device accesses and privileges.	T4-1	4.2.6.2.1	mission critical
	The SMC shall provide support, manage, maintain, and request security testing that includes, at a minimum, password checking.	T4-1	4.2.6.2.1	mission critical
	The LSM shall perform security testing that includes, at a minimum, password auditing and element internal access/privileges checking.	T4-1	4.2.6.2.1	mission critical
	The SMC shall perform compromise detection.	T4-1	4.2.6.2.1	mission critical
	The LSM shall perform compromise (e.g., virus or worm penetration) risk analysis, and detection.	T4-1	4.2.6.2.1	mission critical
	The SMC shall have the capability to initiate recovery procedures in response to a detected security compromise.	T4-1	4.2.6.2.1	mission critical
	The LSM shall isolate the compromised area, detach the compromised input I/O, and the compromised area's output I/O until the compromise has been eliminated.	T4-1	4.2.6.2.1	mission critical

3 ment ID	RTM Requirement Text	Thread/Build ID #	Thread/Build Test Sequence /Case #	Requiren Catego
	The LSM shall generate recovery actions in response to the detection of compromises.	B1	4.1.1.2.10	mission critical
	The LSM shall have the same report generator capability as for the SMC, except it shall be limited to generating reports covering only its particular site or its particular element.	T4-1	4.2.6.2.2, 4.2.6.2.4	mission essentia
	The LSM shall have the capability to generate the same types of reports listed under the SMC report generation service, except that each report shall cover only its particular site or its particular element.	T4-1	4.2.6.2.2, 4.2.6.2.4	mission essentia
	The SMC shall have the capability to generate detailed and summary reports indicating the product generation status made in processing, reprocessing, and storage of all standard products and in processing quick-look data.	T4-1	4.2.6.2.2, 4.2.6.2.4	mission essentia
	he SMC shall have the capability to generate detailed and summary reports indicating the performance of ground resources, including, at a minimum: c. Resource utilization	T4-1	4.2.6.2.2, 4.2.6.2.4	mission essentia
	The SMC shall have the capability to generate detailed and summary security compromise reports indicating security compromises of ground resources and facilities, including, at a minimum: a. Security compromise type and description b. Time of occurrence	T4-1	4.2.6.2.2, 4.2.6.2.4	mission critical